



#2

ENTERED OIPE

RAW SEQUENCE LISTING
 PATENT APPLICATION: US/10/077,054

DATE: 03/04/2002
 TIME: 14:55:07

Input Set : A:\Sequence.app
 Output Set : N:\CRF3\03042002\J077054.raw

```

3 <110> APPLICANT: Makielski, Jonathan C
4   Ye, Bin
6 <120> TITLE OF INVENTION: Sodium Channel Alpha Subunits
8 <130> FILE REFERENCE: 960296.98032
c--> 10 <140> CURRENT APPLICATION NUMBER: US/10/077,054
c--> 11 <141> CURRENT FILING DATE: 2002-02-12
13 <160> NUMBER OF SEQ ID NOS: 10
15 <170> SOFTWARE: PatentIn Ver. 2.1
17 <210> SEQ ID NO: 1
18 <211> LENGTH: 6091
19 <212> TYPE: DNA
20 <213> ORGANISM: Homo sapiens
22 <220> FEATURE:
23 <221> NAME/KEY: CDS
24 <222> LOCATION: (10)..(6054)
26 <400> SEQUENCE: 1
27 gatgagaag atg gca aac ttc cta tta cct cgg ggc acc agc agc ttc cgc 51
28   Met Ala Asn Phe Leu Leu Pro Arg Gly Thr Ser Ser Phe Arg
29       1           5           10
31 agg ttc aca cgg gag tcc ctg gca gcc atc gag aag cgc atg gcg gag   99
32 Arg Phe Thr Arg Glu Ser Leu Ala Ala Ile Glu Lys Arg Met Ala Glu
33 15           20           25           30
35 aag caa gcc cgc ggc tca acc acc ttg cag gag agc cga gag ggg ctg   147
36 Lys Gln Ala Arg Gly Ser Thr Thr Leu Gln Glu Ser Arg Glu Gly Leu
37       35           40           45
39 ccc gag gag gag gct ccc cgg ccc cag ctg gac ctg cag gcc tcc aaa   195
40 Pro Glu Glu Glu Ala Pro Arg Pro Gln Leu Asp Leu Gln Ala Ser Lys
41       50           55           60
43 aag ctg cca gat ctc tat ggc aat cca ccc caa gag ctc atc gga gag   243
44 Lys Leu Pro Asp Leu Tyr Gly Asn Pro Pro Gln Glu Leu Ile Gly Glu
45       65           70           75
47 ccc ctg gag gac ctg gac ccc ttc tat agc acc caa aag act ttc atc   291
48 Pro Leu Glu Asp Leu Asp Pro Phe Tyr Ser Thr Gln Lys Thr Phe Ile
49       80           85           90
51 gta ctg aat aaa ggc aag acc atc ttc cgg ttc agt gcc acc aac gcc   339
52 Val Leu Asn Lys Gly Lys Thr Ile Phe Arg Phe Ser Ala Thr Asn Ala
53 95           100          105          110
55 ttg tat gtc ctc agt ccc ttc cac ccc atc cgg aga gcg gct gtg aag   387
56 Leu Tyr Val Leu Ser Pro Phe His Pro Ile Arg Arg Ala Ala Val Lys
57       115          120          125
59 att ctg gtt cac tcg ctc ttc aac atg ctc atc atg tgc acc atc ctc   435
60 Ile Leu Val His Ser Leu Phe Asn Met Leu Ile Met Cys Thr Ile Leu
61       130          135          140

```

RAW SEQUENCE LISTING
 PATENT APPLICATION: US/10/077,054

DATE: 03/04/2002
 TIME: 14:55:07

Input Set : A:\Sequence.app
 Output Set: N:\CRF3\03042002\J077054.raw

```

63 acc aac tgc gtg ttc atg gcc cag cac gac cct cca ccc tgg acc aag 483
64 Thr Asn Cys Val Phe Met Ala Gln His Asp Pro Pro Thr Thr Lys
65 145 150 155
67 tat gtc gag tac acc ttc acc gcc att tac acc ttt gag tct ctg gtc 531
68 Tyr Val Glu Tyr Thr Phe Thr Ala Ile Tyr Thr Phe Glu Ser Leu Val
69 160 165 170
71 aag att ctg gct cga gcc ttc tgc ctg cac gcg ttc act ttc ctt cgg 579
72 Lys Ile Leu Ala Arg Gly Phe Cys Leu His Ala Phe Thr Phe Leu Arg
73 175 180 185 190
75 gac cca tgg aac tgg ctg gac ttt agt gtg att atc atg gca tac aca 627
76 Asp Pro Trp Asn Trp Leu Asp Phe Ser Val Ile Ile Met Ala Tyr Thr
77 195 200 205
79 act gaa ttt gtg gac ctg gcc aat gtc tca gcc tta cgc acc ttc cga 675
80 Thr Glu Phe Val Asp Leu Gly Asn Val Ser Ala Leu Arg Thr Phe Arg
81 210 215 220
83 gtc ctc cgg gcc ctg aaa act ata tca gtc att tca ggg ctg aag acc 723
84 Val Leu Arg Ala Leu Lys Thr Ile Ser Val Ile Ser Gly Leu Lys Thr
85 225 230 235
87 atc gtg ggg gcc ctg atc cag tct gtg aag aag ctg gct gat gtg atg 771
88 Ile Val Gly Ala Leu Ile Gln Ser Val Lys Lys Leu Ala Asp Val Met
89 240 245 250
91 gtc ctc aca gtc ttc tgc ctc agc gtc ttt gcc ctc atc ggc ctg cag 819
92 Val Leu Thr Val Phe Cys Leu Ser Val Phe Ala Leu Ile Gly Leu Gln
93 255 260 265 270
95 ctc ttc atg ggc aac cta agg cac aag tgc gtg cgc aac ttc aca gcg 867
96 Leu Phe Met Gly Asn Leu Arg His Lys Cys Val Arg Asn Phe Thr Ala
97 275 280 285
99 ctc aac ggc acc aac ggc tcc gtg gag gcc tgg gtc tgg gaa 915
100 Leu Asn Gly Thr Asn Gly Ser Val Glu Ala Asp Gly Leu Val Trp Glu
101 290 295 300
103 tcc ctg gac ctt tac ctc agt gat cca gaa aat tac ctg ctc aag aac 963
104 Ser Leu Asp Leu Tyr Leu Ser Asp Pro Glu Asn Tyr Leu Leu Lys Asn
105 305 310 315
107 ggc acc tct gat gtg tta ctg tgt ggg aac agc tct gac gct ggg aca 1011
108 Gly Thr Ser Asp Val Leu Leu Cys Gly Asn Ser Ser Asp Ala Gly Thr
109 320 325 330
111 tgt ccg gag ggc tac cgg tgc cta aag gca ggc gag aac ccc gac cac 1059
112 Cys Pro Glu Gly Tyr Arg Cys Leu Lys Ala Gly Glu Asn Pro Asp His
113 335 340 345 350
115 ggc tac acc agc ttc gat tcc ttt gcc tgg gcc ttt ctt gca ctc ttc 1107
116 Gly Tyr Thr Ser Phe Asp Ser Phe Ala Trp Ala Phe Leu Ala Leu Phe
117 355 360 365
119 cgc ctg atg acg cag gac tgc tgg gag cgc ctc tat cag cag acc ctc 1155
120 Arg Leu Met Thr Gln Asp Cys Trp Glu Arg Leu Tyr Gln Gln Thr Leu
121 370 375 380
123 agg tcc gca ggg aag atc tac atg atc ttc ttc atg ctt gtc atc ttc 1203
124 Arg Ser Ala Gly Lys Ile Tyr Met Ile Phe Phe Met Leu Val Ile Phe
125 385 390 395
127 ctg ggg tcc ttc tac ctg gtg aac ctg atc ctg gcc gtg gtc gca atg 1251

```

RAW SEQUENCE LISTING

DATE: 03/04/2002

PATENT APPLICATION: US/10/077,054

TIME: 14:55:07

Input Set : A:\Sequence.app

Output Set: N:\CRF3\03042002\J077054.raw

```

128 Leu Gly Ser Phe Tyr Leu Val Asn Leu Ile Leu Ala Val Val Ala Met
129      400      405      410
131 gcc tat gag gag caa aac caa gcc acc atc gct gag acc gag gag aag 1299
132 Ala Tyr Glu Glu Gln Asn Gln Ala Thr Ile Ala Glu Thr Glu Glu Lys
133 415      420      425      430
135 gaa aag cgc ttc cag gag gcc atg gaa atg ctc aag aaa gaa cac gag 1347
136 Glu Lys Arg Phe Gln Glu Ala Met Glu Met Leu Lys Lys Glu His Glu
137      435      440      445
139 gcc ctc acc atc agg ggt gtg gat acc gtg tcc cgt agc tcc ttg gag 1395
140 Ala Leu Thr Ile Arg Gly Val Asp Thr Val Ser Arg Ser Ser Leu Glu
141      450      455      460
143 atg tcc cct ttg gcc cca gta aac agc cat gag aga aga agc aag agg 1443
144 Met Ser Pro Leu Ala Pro Val Asn Ser His Glu Arg Arg Ser Lys Arg
145      465      470      475
147 aga aaa cgg atg tct tca gga act gag gag tgt ggg gag gac agg ctc 1491
148 Arg Lys Arg Met Ser Ser Gly Thr Glu Glu Cys Gly Glu Asp Arg Leu
149      480      485      490
151 ccc aag tct gac tca gaa gat ggt ccc aga gca atg aat cat ctc agc 1539
152 Pro Lys Ser Asp Ser Glu Asp Gly Pro Arg Ala Met Asn His Leu Ser
153 495      500      505      510
155 ctc acc cgt ggc ctc agc agg act tct atg aag cca cgt tcc agc cgc 1587
156 Leu Thr Arg Gly Leu Ser Arg Thr Ser Met Lys Pro Arg Ser Ser Arg
157      515      520      525
159 ggg agc att ttc acc ttt cgc agg cga gac ctg ggt tct gaa gca gat 1635
160 Gly Ser Ile Phe Thr Phe Arg Arg Arg Asp Leu Gly Ser Glu Ala Asp
161      530      535      540
163 ttt gca gat gat gaa aac agc aca gcg ggg gag agc gag agc cac cgc 1683
164 Phe Ala Asp Asp Glu Asn Ser Thr Ala Gly Glu Ser Glu Ser His Arg
165      545      550      555
167 aca tca ctg ctg gtg ccc tgg ccc ctg cgc cgg acc agt gcc cag gga 1731
168 Thr Ser Leu Leu Val Pro Trp Pro Leu Arg Arg Thr Ser Ala Gln Gly
169      560      565      570
171 cag ccc agt ccc gga acc tcg gct cct ggc cac gcc ctc cat ggc aaa 1779
172 Gln Pro Ser Pro Gly Thr Ser Ala Pro Gly His Ala Leu His Gly Lys
173 575      580      585      590
175 aag aac agc act gtg gac tgc aat ggg gtg gtc tca tta ctg ggg gca 1827
176 Lys Asn Ser Thr Val Asp Cys Asn Gly Val Val Ser Leu Leu Gly Ala
177      595      600      605
179 ggc gac cca gag gcc aca tcc cca gga agc cac atc ctc cgc cct gtg 1875
180 Gly Asp Pro Glu Ala Thr Ser Pro Gly Ser His Ile Leu Arg Pro Val
181      610      615      620
183 atg cta gag cac ccg cca gac acg acc acg cca tcg gag gag cca ggc 1923
184 Met Leu Glu His Pro Pro Asp Thr Thr Thr Pro Ser Glu Glu Pro Gly
185      625      630      635
187 ggg ccc cag atg ctg acc tcc cag gct ccg tgt gta gat ggc ttc gag 1971
188 Gly Pro Gln Met Leu Thr Ser Gln Ala Pro Cys Val Asp Gly Phe Glu
189      640      645      650
191 gag cca gga gca cgg cag cgg gcc ctc agc gca gtc agc gtc ctc acc 2019
192 Glu Pro Gly Ala Arg Gln Arg Ala Leu Ser Ala Val Ser Val Leu Thr

```

RAW SEQUENCE LISTING

DATE: 03/04/2002

PATENT APPLICATION: US/10/077,054

TIME: 14:55:07

Input Set : A:\Sequence.app

Output Set: N:\CRF3\03042002\J077054.raw

```

193 655                               660                               665                               670
195 agc gca ctg gaa gag tta gag gag tct cgc cac aag tgt cca cca tgc 2067
196 Ser Ala Leu Glu Glu Leu Glu Glu Ser Arg His Lys Cys Pro Pro Cys
197                               675                               680                               685
199 tgg aac cgt ctg gcc cag cgc tac ctg atc tgg gag tgc tgc ccg ctg 2115
200 Trp Asn Arg Leu Ala Gln Arg Tyr Leu Ile Trp Glu Cys Cys Pro Leu
201                               690                               695                               700
203 tgg atg tcc atc aag cag gga gtg aag ttg gtg gtc atg gac ccg ttt 2163
204 Trp Met Ser Ile Lys Gln Gly Val Lys Leu Val Val Met Asp Pro Phe
205                               705                               710                               715
207 act gac ctg acc atc act atg tgc atc gta ctg aac aca ctg ttc atg 2211
208 Thr Asp Leu Thr Ile Thr Met Cys Ile Val Leu Asn Thr Leu Phe Met
209                               720                               725                               730
211 gcg ctg gag cac tac aac atg aca agt gaa ttc gag gag atg ctg cag 2259
212 Ala Leu Glu His Tyr Asn Met Thr Ser Glu Phe Glu Glu Met Leu Gln
213 735                               740                               745                               750
215 gtc gga aac ctg gtc ttc aca ggg att ttc aca gca gag atg acc ttc 2307
216 Val Gly Asn Leu Val Phe Thr Gly Ile Phe Thr Ala Glu Met Thr Phe
217                               755                               760                               765
219 aag atc att gcc ctg gac ccc tac tac tac ttc caa cag gcc tgg aac 2355
220 Lys Ile Ile Ala Leu Asp Pro Tyr Tyr Tyr Phe Gln Gln Gly Trp Asn
221                               770                               775                               780
223 atc ttc gac agc atc atc gtc atc ctt agc ctg atg gag ctg gcc ctg 2403
224 Ile Phe Asp Ser Ile Ile Val Ile Leu Ser Leu Met Glu Leu Gly Leu
225                               785                               790                               795
227 tcc cgc atg agc aac ttg tgc gtg ctg cgc tcc ttc cgc ctg ctg cgg 2451
228 Ser Arg Met Ser Asn Leu Ser Val Leu Arg Ser Phe Arg Leu Leu Arg
229                               800                               805                               810
231 gtc ttc aag ctg gcc aaa tca tgg ccc acc ctg aac aca ctg atc aag 2499
232 Val Phe Lys Leu Ala Lys Ser Trp Pro Thr Leu Asn Thr Leu Ile Lys
233 815                               820                               825                               830
235 atc atc ggg aac tca gtg ggg gca ctg ggg aac ctg aca ctg gtg cta 2547
236 Ile Ile Gly Asn Ser Val Gly Ala Leu Gly Asn Leu Thr Leu Val Leu
237                               835                               840                               845
239 gcc atc atc gtg ttc atc ttt gct gtg gtg ggc atg cag ctg ttt ggc 2595
240 Ala Ile Ile Val Phe Ile Phe Ala Val Val Gly Met Gln Leu Phe Gly
241                               850                               855                               860
243 aag aac tac tgc gag ctg agg gac agc gac tca ggc ctg ctg cct cgc 2643
244 Lys Asn Tyr Ser Glu Leu Arg Asp Ser Asp Ser Gly Leu Leu Pro Arg
245                               865                               870                               875
247 tgg cac atg atg gac ttc ttt cat gcc ttc ctg atc atc ttc cgc atc 2691
248 Trp His Met Met Asp Phe Phe His Ala Phe Leu Ile Ile Phe Arg Ile
249                               880                               885                               890
251 ctg tgt gga gag tgg atc gag acc atg tgg gac tgc atg gag gtg tgc 2739
252 Leu Cys Gly Glu Trp Ile Glu Thr Met Trp Asp Cys Met Glu Val Ser
253 895                               900                               905                               910
255 ggg cag tca tta tgc ctg ctg gtc ttc ttg ctt gtt atg gtc att ggc 2787
256 Gly Gln Ser Leu Cys Leu Leu Val Phe Leu Leu Val Met Val Ile Gly
257                               915                               920                               925

```

RAW SEQUENCE LISTING

DATE: 03/04/2002

PATENT APPLICATION: US/10/077,054

TIME: 14:55:07

Input Set : A:\Sequence.app

Output Set : N:\CRF3\03042002\J077054.raw

```

259 aac ctt gtg gtc ctg aat ctc ttc ctg gcc ttg ctg ctc agc tcc ttc      2835
260 Asn Leu Val Val Leu Asn Leu Phe Leu Ala Leu Leu Leu Ser Ser Phe
261          930          935          940
263 agt gca gac aac ctc aca gcc cct gat gag gac aga gag atg aac aac      2883
264 Ser Ala Asp Asn Leu Thr Ala Pro Asp Glu Asp Arg Glu Met Asn Asn
265          945          950          955
267 ctc cag ctg gcc ctg gcc cgc atc cag agg ggc ctg cgc ttt gtc aag      2931
268 Leu Gln Leu Ala Leu Ala Arg Ile Gln Arg Gly Leu Arg Phe Val Lys
269          960          965          970
271 cgg acc acc tgg gat ttc tgc tgt ggt ctc ctg cgg cag cgg cct cag      2979
272 Arg Thr Thr Trp Asp Phe Cys Cys Gly Leu Leu Arg Gln Arg Pro Gln
273 975          980          985          990
275 aag ccc gca gcc ctt gcc gcc cag ggc cag ctg ccc agc tgc att gcc      3027
276 Lys Pro Ala Ala Leu Ala Ala Gln Gly Gln Leu Pro Ser Cys Ile Ala
277          995          1000          1005
279 acc ccc tac tcc ccg cca ccc cca gag acg gag aag gtg cct ccc acc      3075
280 Thr Pro Tyr Ser Pro Pro Pro Pro Glu Thr Glu Lys Val Pro Pro Thr
281          1010          1015          1020
283 cgc aag gaa aca cgg ttt gag gaa ggc gag caa cca ggc cag ggc acc      3123
284 Arg Lys Glu Thr Arg Phe Glu Glu Gly Glu Gln Pro Gly Gln Gly Thr
285          1025          1030          1035
287 ccc ggg gat cca gag ccc gtg tgt gtg ccc atc gct gtg gcc gag tca      3171
288 Pro Gly Asp Pro Glu Pro Val Cys Val Pro Ile Ala Val Ala Glu Ser
289          1040          1045          1050
291 gac aca gat gac caa gaa gaa gat gag gag aac agc ctg ggc acg gag      3219
292 Asp Thr Asp Asp Gln Glu Glu Asp Glu Glu Asn Ser Leu Gly Thr Glu
293 1055          1060          1065          1070
295 gag gag tcc agc aag cag gaa tcc cag cct gtg tcc ggt ggc cca gag      3267
296 Glu Glu Ser Ser Lys Gln Glu Ser Gln Pro Val Ser Gly Gly Pro Glu
297          1075          1080          1085
299 gcc cct ccg gat tcc agg acc tgg agc cag gtg tca gcg act gcc tcc      3315
300 Ala Pro Pro Asp Ser Arg Thr Trp Ser Gln Val Ser Ala Thr Ala Ser
301          1090          1095          1100
303 tct gag gcc gag gcc agt gca tct cag gcc gac tgg cgg cag cag tgg      3363
304 Ser Glu Ala Glu Ala Ser Ala Ser Gln Ala Asp Trp Arg Gln Gln Trp
305          1105          1110          1115
307 aaa gcg gaa ccc cag gcc cca ggg tgc ggt gag acc cca gag gac agt      3411
308 Lys Ala Glu Pro Gln Ala Pro Gly Cys Gly Glu Thr Pro Glu Asp Ser
309          1120          1125          1130
311 tgc tcc gag ggc agc aca gca gac atg acc aac acc gct gag ctc ctg      3459
312 Cys Ser Glu Gly Ser Thr Ala Asp Met Thr Asn Thr Ala Glu Leu Leu
313 1135          1140          1145          1150
315 gag cag atc cct gac ctc gcc cag gat gtc aag gac cca gag gac tgc      3507
316 Glu Gln Ile Pro Asp Leu Gly Gln Asp Val Lys Asp Pro Glu Asp Cys
317          1155          1160          1165
319 ttc act gaa ggc tgt gtc cgg cgc tgt ccc tgc tgt gcg gtg gac acc      3555
320 Phe Thr Glu Gly Cys Val Arg Arg Cys Pro Cys Cys Ala Val Asp Thr
321          1170          1175          1180
323 aca cag gcc cca ggg aag gtc tgg tgg cgg ttg cgc aag acc tgc tac      3603

```

VERIFICATION SUMMARY

PATENT APPLICATION: US/10/077,054

DATE: 03/04/2002

TIME: 14:55:08

Input Set : A:\Sequence.app

Output Set: N:\CRF3\03042002\J077054.raw

L:10 M:270 C: Current Application Number differs, Replaced Application Number

L:11 M:271 C: Current Filing Date differs, Replaced Current Filing Date